Question Number	Scheme	Marks
1	$y=(2x+5)\mathrm{e}^{3x}$ $\frac{\mathrm{d}y}{\mathrm{d}x}=2\mathrm{e}^{3x}+(2x+5)3\mathrm{e}^{3x}$ $\frac{\mathrm{d}y}{\mathrm{d}x}=0\Rightarrow 2+3(2x+5)=0\Rightarrow x=-\frac{17}{6}$	M1 A1 dM1A1 **(4)** **(4 marks)**

M1: Attempts the product rule and achieves a form $\left(\frac{\mathrm{d}y}{\mathrm{d}x}\right)=A\mathrm{e}^{3x}+B(2x+5)\mathrm{e}^{3x}$ where A and B are positive constants. Condone missing/poor bracketing

Note that this could be attempted from $y=2x\mathrm{e}^{3x}+5\mathrm{e}^{3x}\Rightarrow\frac{\mathrm{d}y}{\mathrm{d}x}=A\mathrm{e}^{3x}+Bx\mathrm{e}^{3x}+C\mathrm{e}^{3x}$

A1: Correct $\frac{\mathrm{d}y}{\mathrm{d}x}=2\mathrm{e}^{3x}+(2x+5)3\mathrm{e}^{3x}$ o.e. There is no requirement to simplify this

dM1: Dependent upon the previous M, it is for using a correct strategy to find a value for x.

E.g. Sets or implies $\frac{\mathrm{d}y}{\mathrm{d}x}=0$, cancels or factorises out the e^{3x} term and solves a linear equation in x

In most cases where lns are used it will be M0

Example of M0

$\mathrm{e}^{3x}(6x+17)=0\Rightarrow\ln\left(\mathrm{e}^{3x}(6x+17)\right)=\ln(0)\Rightarrow 3x(6x+17)=...$

Example of M1

$\mathrm{e}^{3x}(6x+17)=0\Rightarrow(6x+17)=0,\qquad\left(\mathrm{e}^{3x}=0\right)$

$x=...$

A1: $x=-\frac{17}{6}$ o.e. only. If an extra solution is given, e.g. from $\mathrm{e}^{3x}=0$, it is A0

Condone awrt -2.83 following a correct equation. Ignore any attempt to find y